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July 3, 1985

Alfalfa Leafcutting Bee Newsletter: Volume II, No. II
TITLE: Webworms, Insecticides and Drought,
Why Me?

It seems that dry, drought conditions generally bring on unusual numbers and types of insects. This year Montana alfalfa seed fields seem to be no exception. Insecticides of many types have been used thus far for control of grasshoppers, alfalfa webworms, lygus, spotted alfalfa aphids and alfalfa weevils. Commonly used cleanup sprays prior to bee placement have been Furadan and Parathion. Not so commonly used types have been Lorsban, Dibrome, Cygon and Dylox. Lorsban, Parathion and Dibrome at the right rates have worked successfully on all these insect types and as a rule fields are fairly "clean" prior to bee placement. The effect of Furadan on spotted aphids is unknown. Also, as a rule, bloom in the fields seems to be roughly 2 weeks earlier than last year which makes it hard (at best) to have ideal timing for bee placement in the field. Many fields throughout Montana are now in full bloom. It should be noted that Furadan, Parathion, Lorsban, Cygon and Dibrome are not safe to use after bees are in the field. Furadan has been blamed for killing leafcutting bees up to 3 weeks from the date of application. Dibrome has been applied in the evening in Nevada with no apparent bee kill the following day while leafcutting bees are in the field. However, with cool nights or late applications devastating bee kills took place. Also, Dibrome (Naled) is very damaging to any beneficials that may be present. Dibrome seems to work well as a clean up spray for webworms prior to bee flight in the fields. One advantage of Dibrome is that it can be used up to 2 days prior to bee placement and is effective on grasshoppers, aphids, lygus, alfalfa weevil and webworms, although if beneficial insects

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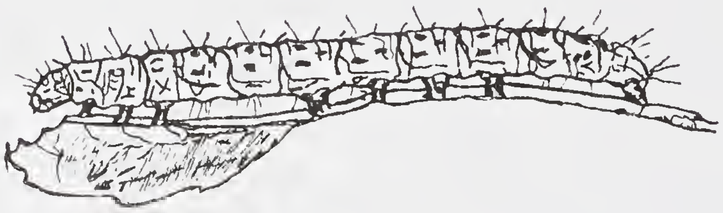
are present in significant numbers another chemical alternative should be considered. A publication listing seed pests, chemicals and intervals necessary between application and introduction of pollinators has been provided. Please check with it if an insecticide is being considered for pest control.



Alfalfa Webworms

During the spring and summer months fields that are infested will show light webs over the leaves in which will be found green to yellow-green, somewhat hairy worms with black dots over their bodies. Under protection of the webs the larvae (worms) may consume all the green tissue of the leaves.

When full grown the larvae are an inch or a little more in length, green to nearly black with a light stripe extending down the middle of the back. When disturbed, worms may drop to the ground or retreat into tubular webs which they have spun. Fields that are heavily infested will show a considerable amount of webbing over the alfalfa and the leaves inside these webs will be all nearly eaten off. If webbing is placed over alfalfa bloom, the bloom is generally dropped prematurely. In the late summer or fall, worms may work in somewhat the same manner as cutworms on newly seeded alfalfa. At this time, they "hide" in silken lined burrows or in the ground to which they retreat when disturbed.

These insects are native to both North and South America and occur generally in the farming areas of the United States, Canada and Mexico.

The winter is passed in the pupal stage in the soil about the plants on which the fall generation feeds. Adults (moths) emerge from the pupae early in the spring and deposit their eggs on the leaves of their food plants. The eggs are laid in masses of from 2 to 3 to 20 or 50.

The moths are about 1 inch to 1.25 inches wide from wing tip to wing tip when the wings are spread. They are not active during the daytime unless disturbed. They often congregate around lights on warm nights. The larvae hatch from the eggs in 3 days to 1 week. They begin feeding on the underside of the leaves, protecting themselves inside the webbing described. It usually requires 3 to 5 weeks for the worms to reach the largest stage. They then go into the ground for pupation (cacoon stage). When short of food the alfalfa webworms sometimes migrate like army worms. The pupal period is normally 1 to 3 weeks. In Montana there are most likely 2, possibly 3 generations in a year.

Control

Fields which become infested can be cleaned of webworms by cutting them for hay. Chemicals registered for cutworms are listed in Table 1. If bees are flying, Dylox would be a feasible chemical control if the worms are still in the smaller (1/2 inch?) stages. The idea behind timing an ideal treatment would be to spray when the most eggs have hatched and the worms are still small. Dylox is also effective on lygus which may be present and is relatively easy on beneficials. We are lucky in one respect in Montana in that lygus are evidently not yet resistant to Dylox. It would be nice to devise a system to monitor any resistance that may be building in areas that have used Dylox for some time. Any other chemicals listed in the table should only be used as clean-up sprays prior to bee flight since they kill bees for extended periods of time (see the previously described publication). Best wishes until the next newsletter.

REFERENCES USED:

Metcalf, C.L., Flint, W.P. and Metcalf, R.L. 1962. IN: Destructive and Useful Insects, Their Habits and Control, McGraw Hill Book Co., pp. 557-559.

Pacific Northwest Insect Control Handbook. March, 1984. University of Oregon, Idaho and Washington, pp. 170-173.

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Use of trade names does not imply endorsement of one produce over another.

TABLE 1

Chemicals Registered for Alfalfa Webworm in Alfalfa

Sevin 80S	Union Carbide
Sevimol 4	Union Carbide
Clean Crop Sevimol 4	Platte Chemical Company
Sevin XLR	Union Carbide
Sevin FR	Union Carbide
Aqua 8 Parathion	FMC Corporation
Proxol 80 SP	The Upjohn Company
Methoxychlor Emulsifiable Concentrate	Farmland Industries
Clean Crop Trinox Liquid Insecticide	Platte Chemical Company
Dibrom 8 Spray	Wilbur Ellis
Dylox Liquid Solution Insect	Mobay Chemical Company
Dylox 80% Soluble PWD Crop Insect	Mobay Chemical Company
Methoxychlor E-Z	Cornbelt Chemical Company
Clean Crop Methoxychlor 2EC	Platte Chemical Company

LEGUME, FIELD, AND VEGETABLE SEED CROPS

(See also Western Regional Extension Publication (WREP) II for additional information.)

ALFALFA SEED PESTS

The symbol † is used to identify legal pesticide uses not found on pesticide labels. These pesticide uses are not recommended by University of Idaho personnel.

The following materials are presently registered for use in the Pacific Northwest. This information is based on research by scientists of the University of Idaho, Oregon State University, Washington State University, and the U.S.D.A. as an insect management and control guide for insect pests of alfalfa grown for seed. For further information concerning applications, timing, etc., obtain WREP II. Insect Management and Control on Crops Grown for Seed, 1982, from your county agent.

Pest	Description and damage	Control Dosages refer to actual amt. of toxicant per acre	Remarks* Interval between last application and introduction of bee pollinators
Alfalfa weevil *Hypera postica*	Larvae are about ⅜ inch long, green, with a white stripe down the back. They feed on the leaves and stems of alfafa. *NOTE:* Sevin and methyl parathion have caused some phytotoxic effects under Oregon and Nevada conditions. Protect pollinating insects. See bee poisoning section, giving relative hazard of pesticides to honeybees and wild bees.	LARVAL CONTROL: *Prebloom only*	
		malathion - 1.25 lbs.	5 days.
		methoxychlor - 1.5 lbs.	5 days.
		diazinon - 1 lb.	7 days.
		Supracide - 0.5 to 1 lb.	7 days.
		Furadan - 0.25 to 1 lb.	0.25 lb. - 7 days. 0.5 lb. - 14 days. 0.75 to 1 lb. 3 to 4 weeks. Make only 1 application/season
		Dylox †trichlorfon** - 1 lb. (When necessary during bloom.)	1 day.
		methomyl - 0.9 lb.	7 days.
		Imidan - 1 lb.	7 days.
		methyl parathion - 0.5 lb.	7 days. Do not use Penncap-M.
		ethyl parathion - 0.5 lb.	7 days.
		Lorsban 4E - 0.5 to 1.0 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
		Phosdrin - 0.25 to 0.5 lb.	1 day.
		When to treat: When populations of larvae reach 20 or more per straight-line (90° sweep) it should be understood that 20 larvae per sweep is simply a general index to assist growers in determining when to treat. Weather conditions, plant vigor, irrigation schedules, cutting date, previous history of weevils in the area, and a complex of factors may determine if treatment is justified. Experience with the insect has shown that treatment should be applied when necessary, and not as a preventive practice.	
Loopers, including Alfalfa looper *Autographa californica* and Cabbage looper *Trichoplusia ni*	Adult moth grayish to light brown in color. Mature larvae about 1 inch long, light-green to olive-green with a pale-colored head. Move in looping fashion. Usually controlled by a natural virus.	Dylox trichlorfon** - 1 lb.	1 day.
		methomyl - 0.23 to 0.9 lb.	7 days.
		Bacillus thuringiensis	0 days.
		Dibrom - 0.5 to 1 lb.	1 day.
		Lorsban 4E - 0.5 to 1.0 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
Alfalfa seed chalcid *Bruchophagus roddi*	The adult is a small, shiny, black, wasp-like insect. The larvae feed within the seed and destroy it.	Cultivating in fall with a spring-tooth harrow to a depth of at least 1 inch to bury infested seed followed by irrigation aids in reducing chalcid numbers.	Cutting and removal of hay during May will delay and reduce populations. Destroy or burn chaff stacks and screenings by April 1. Remove volunteer and waste area alfalfa plants. Disking to bury light seeds at least 1 inch in soil during the fall will reduce emergence.

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* If the alfalfa is to be cut for hay, see the section on Legume Hay for interval between application and harvest

** Buffering trichlorfon to an acid condition has extended the control period in areas where alkaline water conditions exist. Do not use water that is over 80° F. Hot water inactivates trichlorfon. Do not use more than 1 to 2 pts. acidifier per 100 gal. spray because of increased hazard to honeybees

ALFALFA SEED PESTS (Continued)

Pest	Description and damage	Control Dosages refer to actual amt. of toxicant per acre	Remarks* Interval between last application and introduction of bee pollinators
Aphids Pea aphid *Acyrthosiphon pisum* Alfalfa aphid *Macrosiphum creelii* Blue alfalfa aphid *Acyrthosiphon kondoi*	The common light-green aphid found on legume plants. They feed by sucking plant juices from the leaves, stems, and pods. *When to treat:* *The pea aphid is considered to be injurious when:* *the population approaches 100 per sweep, and the plants are less than a foot high, or the field is under water stress, and plants are wilting.*	*Prebloom*	
		Di-Syston - 1 lb. granules	No time limitation.
		Di-Syston - 0.5 lb. EC	
		dimethoate - 0.5 lb.	7 days.
		parathion - 0.5 lb.	7 days.
		methyl parathion - 0.5 lb.	7 days. Penncap-M not recommended.
		malathion - 1.25 lbs.	5 days.
		Supracide - 0.5 lb.	7 days.
		diazinon - 0.5 lb.	7 days.
		Lorsban 4E - 0.5 to 1.0 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
		During bloom or prebloom	
	Populations of the blue alfalfa aphid may cause damage when present in numbers fewer than 100 per sweep. *PROTECT POLLINATING INSECTS* See summary section, giving relative hazard of pesticides to honeybees and wild bees.	Metasystox-R - 0.25 lb.	1 day. Use as necessary up to 21 days before harvest. Chaff from seed crop may be used for livestock feed, but do not cut green crop for this purpose.
		Systox 0.125 to 0.25 lb.	1 day.
Spotted alfalfa aphid *Therioaphis maculata*	Small yellow to brown aphid with red bumps on back. Secretes much honeydew and affects plant vigor. Occurs from July on in damaging numbers.	endosulfan 3 EC - 0.5 lb.	3 days. This aphid is very difficult to control. It is necessary to remove leafcutter bees from the field prior to application. Spray by ground with at least 25 gallons of water per acre. Damage is most severe on seedling stands. In established stands, treat when an average of 20-30 spotted aphids per stem occur and the population is increasing.
		Lorsban - 0.5 to 1.0 lb.	7 to 14 days. In Nevada use the high rate for this pest.
Webworms, including Beet webworm *Loxostege sticticolis*	Caterpillars are variable light to dark with 3 white longitudinal stripes and many black and white tubercles.	trichlorfon** - 1 lb.	1 day.
Armyworms, including Western yellowstriped armyworm *Spodoptera praefica* Bertha armyworm *Mamestra configurata*	Caterpillars are 1½-2 inches in length when mature. They are velvety black in color with 2 prominent and several fine, bright, yellow stripes on the sides. They differ from most cutworms in that they generally feed during the day and rest at night. Pest on alfalfa, alsike clover and other legumes. *PROTECT POLLINATING INSECTS:* See summary section, giving relative hazard of pesticides to honeybees and wild bees.	trichlorfon** - 1 lb.	1 day.
		malathion - 1.25 lbs.	1 day. (Alkali bee program.)
		methomyl - 0.23 to 0.45 lb.	7 days.
		Dibrom - 1 lb.	1 day.
			During last half of June check ground under plants for worms. These sprays are only effective on small larvae.
		Lorsban 4E - 0.5 to 1.0 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
Clover root curculio *Sitona hispidula*	Adult small, grayish weevils 1/6 inch long. Larvae feed on fibrous roots and chew cavities in main roots.	Studies over a period of years indicate this insect usually does not cause economic damage to alfalfa.	

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ALFALFA SEED PESTS (Continued)

Pest	Description and damage	Control Dosages refer to actual amt. of toxicant per acre	Remarks* Interval between last application and introduction of bee pollinators
Cutworms Family Noctuidae Most common species are: Variegated cutworm *Peridroma saucia* Redbacked cutworm *Euxoa ochrogaster* Army cutworm *Euxoa auxiliaris* Clover cutworm *Scotogramma trifolii*	Cutworms usually feed at night. They cut off young plants or feed on the foliage of older plants. Cutworms are primarily a pest of alfalfa and clovers, but will attack other legumes. Usually dull grey, black or brown, may be striped or spotted. They often curl up when disturbed. If alfalfa fields do not "green up" in the spring it may indicate the presence of cutworms (particularly red-backed or army cutworms). Examine around plants in late afternoon or on cloudy days for cutworms. Irrigate field before treating for red-backed cutworm and army cutworm.	trichlorfon bait - 1 lb.	0 days.
		methoxychlor - 3 lbs.	1 day.
		Sevin bait - 1.5 lbs.	0 days.
		Lorsban 4E - 0.5 to 1.0 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
Grasshoppers Family Acrididae Several species *Melanoplus* spp. dominant	Both young and adult grasshoppers do damage. In addition to foliage injury, feeding on blossoms prevents seed formation. *PROTECT POLLINATING INSECTS.* See summary section, giving relative hazard of pesticides to honeybees and wild bees.	*Prebloom only*	
		malathion EC - 1 lb.	1 day. (Alkali bee program only)
		diazinon - 0.5 lb.	7 Days.
		Furadan - 0.12 to 0.25 lb.	Do not apply more than once per season. Apply only to pure alfalfa stands. Do not move bees into treated fields within 7 days of application.
		Cygon - 0.25 to 0.5 lb.	10 days. Do not apply in the bloom period.
		carbaryl (bait)	0 day. See label.
		Dibrom - 1 lb.	1 day.
		Lorsban 4E - 0.25 to 0.5 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Only one application per crop cutting. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
Lygus bugs *Lygus* spp. (Several species)	Adults are 3/16 inch long, have a light yellow "V" on back. Lygus bugs suck juices from productive portion of the plant causing blasted buds, blossom drop, and shriveled seed. *PROTECT POLLINATING INSECTS.* Before using any insecticide see summary section, giving relative hazard of pesticides to honeybees and wild bees.	*Prebloom*	
		dimethoate - 0.5 lb.	7 days.
		Furadan - 0.25 to 1 lb.	14 to 28 days prior to bloom.
		Supracide - 0.5 to 1 lb.	7 days prior to bloom.
		Dibrom - 1 lb.	1 day.
		methyl or ethyl parathion	5 days. See manufacturer's labels for rates.
		Lorsban 4E - 0.5 to 1.0 lb.	7 to 14 days. Apply as a foliar broadcast spray. Use at least 2 gals. of water/A with aerial application. Only one application per crop cutting. Minor phytotoxicity may occur on young, tender, rapidly growing plants.
		During bloom or prebloom	
		Dylox→ trichlorfon** - 0.5 to 1 lb.	1 day.
		Metasystox-R - 0.5 lb.	1 day. Metasystox-R may repel bees from the field for 3 to 8 days following application. Lower rates of Furadan, Supracide and Dylox are recommended in new seed-growing areas to help prevent the development of insecticidal resistance.

When to Treat:

First Application: Apply insecticides after the first cutting and before second growth reaches the bud stage, on warm days of late May. Be sure that no blooming weeds are present in the field at the time of application. Use at least 10 gallons of spray per acre for aerial applications.

Second Application: During bloom, usually when lygus bugs (adult plus nymphs) reach 1½ per straight (90°) sweep of a 15-inch net (3 per sweep in a 180° arc) but before nymphs reach third instar state (½ grown), use trichlorfon (may cause foliage injury) or Metasystox-R. Dibrom is *not* recommended during early season because night applications can cause severe killing of either leafcutting or alkali bees during the following day. Dibrom also kills the beneficial bigeyed bug and damsel bug predators. Trichlorfon and Metasystox-R are the least predator-destructive materials available for this program. Since trichlorfon has short residual effectiveness, make frequent population checks and repeat as needed. Do not store trichlorfon at temperatures above 100° F since it loses strength rapidly at high temperatures. Mix only with relatively cool spray water (80° F or less).

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* If the alfalfa is to be cut for hay, see the section on Legume Hay for interval between application and harvest.

** Buffering trichlorfon to an acid condition has extended the control period in areas where alkaline water conditions exist. Do not use water that is over 80° F. Hot water inactivates trichlorfon. Do not use more than 1 to 2 pts. acidifier per 100 gal. spray because of increased hazard to bees.

ALFALFA SEED PESTS (Continued)

Pest	Description and damage	Control Dosages refer to actual amt. of toxicant per acre	Remarks* Interval between last application and introduction of bee pollinators
Pea leaf weevil *Sitona lineata*	Adults small, grayish-brown, faintly striped weevils about 1/6 inch long. Appear in large numbers in spring and sometimes late summer. Adult feeding may kill seedling plants, and seriously defoliate older stands.	methoxychlor - 1.25 to 2.5 lbs. Imidan - 1 lb.	These insects migrate into fields from border areas, and often it is possible to spot treat infested or injured areas only. 1 day. 7 days.
Slugs		metaldehyde bait 4% - 1.5 to 2.4 lbs. Oregon label.	30 days. Do not contaminate edible plant parts. Use as needed, but not more often than once a week.
Spider mites Twospotted spider mite *Tetranychus urticae* Strawberry spider mite *Tetranychus turkestani* Pacific mite *Tetranychus pacificus*	Not insects, they are tiny eight-legged animals less than 3/100 inch long. Mites suck juices from leaves, which devitalize and yellow plants. Some species form webbing over leaves and flowers. Late season infestations may not seriously affect seed production. They are pests of both alfalfa and clovers. Primarily a pest of clovers. Treatment may be justified when 25% of the leaves show damage in early summer, 50% in midsummer. Treatment may not be justified with 75 to 100% leaf damage after August 15. *PROTECT POLLINATING INSECTS:* See summary section, giving relative hazard of pesticides to honeybees and wild bees.	Comite - 1.3 to 2 lbs. Kelthane - 1 lb. Carzol - 0.46 lb. Phosdrin - 0.5 lb.	1 day. Do not feed. Ground application with 25 to 40 gallons of water per acre will give best results. Use a minimum of 10 gallons of water per acre if application is by air. 1 day. Do not feed. 7 days. Prebloom use only. Do not feed. 1 day. Miticides should *not* be applied in mixtures with insecticides because this increases the hazard to pollinating bees.
Thrips *Frankliniella* spp.	Small, slender, quick-moving insects about 1/10 inch long.	Almost all programs involving use of insecticides to control other injurious insects will reduce thrips populations.	Chemical control is not recommended when applied solely for thrips.

CLOVER SEED PESTS

The symbol † is used to identify legal pesticide uses not found on pesticide labels. These pesticide uses are not recommended by University of Idaho personnel.

This information is based on research by scientists of the University of Idaho, Oregon State University, Washington State University, and the U S D A as an insect management and control guide for insect pests of clover grown for seed. For further information concerning applications, timing, etc., obtain WREP 11, Insect Management and Control on Crops Grown for Seed, 1980, from your county agent.

Pest	Description and damage	Control Amount of active ingredient per acre	Remarks* Interval between last application and introduction of bee pollinators
Loopers, including Alfalfa looper *Autographa californica*	Adult moth grayish to light brown in color. Mature larvae about 1 inch long, light-green to olive-green with a pale colored head. Move in a looping fashion.	trichlorfon** - 1 lb. methoxychlor - 3 lbs. *Bacillus thuringiensis*	1 day. 1 day. 0 days.
Webworms, including [illegible] webworm *[illegible]ostege sticticalis*		trichlorfon** - 1 lb. methoxychlor - 1 to 3 lbs.	1 day. 1 day.

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* [illegible] is to be cut for hay, see the section on Legume Hay for interval between application and harvest.

** [illegible] trichlorfon to an acid condition has extended the control period in areas where alkaline water conditions exist. Hot water inactivates trichlorfon. Do not use more than 1 to 2 pts. acidi-[illegible]cals spray because of increased hazard to bees.